IN THE CLAIMS:

The text of all pending claims, (including withdrawn claims) is set forth below. Cancelled and not entered claims are indicated with claim number and status only. The claims as listed below show added text with underlining and deleted text with ~~strikethrough~~. When strikethrough cannot easily be perceived, or when five or fewer characters are deleted, [[double brackets]] are used to show the deletion. The status of each claim is indicated with one of (original), (currently amended), (cancelled), (withdrawn), (new), (previously presented), or (not entered).

1. (Currently Amended) A metal photoetching product, comprising:

at least one large cavity of minor axis W_1S, major axis W_1L and depth D1 in a surface of the product, wherein

one or more cavities are included inside at least one of the at least one large cavity, and

a smallest hole among the cavities has minor axis of W_2S, major axis W_2L, and depth D2; and

~~the product satisfies the following dimensions,~~ D1 + D2 = plate thickness D, 0.02 mm $\leq$ D $\leq$ 2 mm, 0.4 x D < W_1S < D, and 0.2 x D < W_2S < 0.8 x D; and

at least one combination of the large cavity and the smallest hole formed in the large cavity has an etching factor of 2.6 or more, where the etching factor is EF=ED/SE wherein EF represents the etching factor, ED represents an etched depth of a cavity to be evaluated, SE represents a primary side etching which is a half of a difference between a dimension of an opening of the cavity formed by primary etching and a dimension of an opening of a photoresist pattern used for the primary etching, and when there are two primary side etchings as a result of photoetching conducted from both upper and lower surfaces of a metal substrate, SE represents the larger one.

2. (Currently Amended) A metal photoetching product, comprising:

at least one combination of a large cavity of minor axis W_1S, major axis W_1L and depth D1, and a small cavity of minor axis W_2S, major axis W_2L and depth D2 in a surface of the metal photoetching product;, wherein ~~the product satisfies the following dimensions,~~

0.02 mm ≤ D ≤ 2 mm, 0.5 x W_1S < D1 < D, 0.5 x W_2S < D2 < D, 1.7 x W_2S < W_1S < 5 x W_2S, and 0.5 x D2 < D1 < 1.5 x D2, and

at least one of the large cavity and the small cavity has an etching factor of 2.6 or more, where the etching factor is EF=ED/SE wherein EF represents the etching factor, ED represents an etched depth of a cavity to be evaluated, SE represents a primary side etching which is a half of a difference between a dimension of an opening of the cavity formed by primary etching and a dimension of an opening of a photoresist pattern used for the primary etching, and when there are two primary side etchings as a result of photoetching conducted from both upper and lower surfaces of a metal substrate, SE represents the larger one.

3. (Currently Amended) A metal photoetching product, comprising:

at least one combination of a large cavity of minor axis W_1s, major axis W_1L and depth D1, and a small cavity of minor axis W_2S, major axis W_2L and depth D2 in a surface of the metal photoetching product;, wherein

~~the product satisfies following the dimensions,~~ 0.02 mm ≤ D ≤ 2 mm, 0.5 x W_1S < D1 ≤ D, 0.5 x W_2S < D2 ≤ D, W_2S < W_1S < 2.0 x W_2S, and 0.2 x D1 < W_2S < 0.8 x D1, and

at least one of the large cavity and the small cavity has an etching factor of 2.6 or more, where the etching factor is EF=ED/SE wherein EF represents the etching factor, ED represents an etched depth of a cavity to be evaluated, SE represents a primary side etching which is a half of a difference between a dimension of an opening of the cavity formed by primary etching and a dimension of an opening of a photoresist pattern used for the primary etching, and when there are two primary side etchings as a result of photoetching conducted from both upper and lower surfaces of a metal substrate, SE represents the larger one.

4. (Original) A metal photoetching product comprising

a processed portion having a metal pattern, wherein

the processed portion includes a first side wall formed by primary etching on a surface layer side of a metal layer and at least one second side wall, which extends in a direction of thickness of the film, connects to the first side wall formed by the primary etching, and is formed by etching one or more times using an electrodeposited resist; and

the metal pattern has a form comprising a cavity provided by at least second etching which has a different form than a cavity provided by the primary etching.

5. (Currently Amended) A metal photoetching product comprising

a processed portion having a metal pattern of a complex and three-dimensional shape, wherein

the processed portion includes a first side wall formed by primary etching on a surface layer side of a metal layer and at least one second side wall, which extends in a direction of thickness of the film to the first side wall formed by the primary etching and is formed by etching one or more times using an electrodeposited resist; and

an etching factor of an opening of the metal pattern is 2.6 or more, where the etching factor is EF=ED/SE wherein EF represents the etching factor, ED represents an etched depth of a cavity to be evaluated, SE represents a primary side etching which is a half of a difference between a dimension of an opening of the cavity formed by primary etching and a dimension of an opening of a photoresist pattern used for the primary etching, and when there are two primary side etchings as a result of photoetching conducted from both upper and lower surfaces of a metal substrate, SE represents the larger one.

6. (Withdrawn) A production method of a metal photoetching product comprising:

preparing a metal substrate and providing at least one photoresist layer on at least a portion of the substrate;

providing one or more openings on the photoresist layer by exposure and development;

carrying out primary etching to form one or more cavities corresponding to the openings;

providing an electrodeposition photoresist layer on the etched substrate;

providing at least one opening on the electrodeposition photoresist layer within at least one of the cavities by exposure and development; and

carrying out second etching after development.

7. (Withdrawn) A production method of a metal photoetching product according to claim 6, wherein the providing of an electrodeposition photoresist layer, the forming of at least one opening, and the carrying out of second etching are repeated a plurality of times.

8. (Withdrawn) A production method of a metal photoetching product according to claim 6, wherein said at least a portion is on one side or both of two sides of the metal substrate, and the electrodeposition photoresist is a positive photoresist.

9. (Withdrawn) A production method of a metal photoetching product according to claim 6, further comprises removing the photoresist layer after primary etching.

10. (Withdrawn) A production method of a metal photoetching product according to claim 6, wherein the at least one opening provided by exposure becomes smaller the higher an order of etching.

11. (Withdrawn) A production method of a metal photoetching product according to claim 6, comprising:

preparing a metal substrate to provide the at least one photoresist layer as top and bottom photoresist layers of the substrate;

providing one or more large openings on the top photoresist layer by exposure and development, while providing one or more small openings on the bottom photoresist layer corresponding to locations of the large openings;

carrying out primary etching to form cavities corresponding to the large and small openings;

providing an electrodeposition photoresist layer on the etched substrate;

providing at least one further opening on the electrodeposition photoresist layer within at least one of the cavities by exposure and development;

carrying out second etching; and

repeating the immediately preceeding three steps to obtain a hole that passes through the substrate from top to bottom.

12. (Withdrawn) A production method of a metal photoetching product according to claim 6, comprising:

preparinga metal substrate and providing the at least one photoresist layer on one side of the substrate;

providing one or more large openings and small openings in the photoresist layer by exposure and development;

carrying out primary etching to form cavities in the substrate;

providing an electrodeposition photoresist layer on the etched substrate;

providing at least one opening in the electrodeposition photoresist layer within at least one of the large cavities and the small cavities by exposure and development;

carrying out second etching; and

repeating the immediately preceeding three steps.

13. (Withdrawn) A production method of a metal photoetching product having a complex, three-dimensional shape, comprising:

coating a photoresist onto a metal surface;

exposing and developing the photoresist using a first photomask to form holes in the photoresist so that it has an opening pattern;

carrying out primary etching of the metal;

after removing the photoresist used in primary etching, providing a coating of an electrodeposited resist over the entire surface of the metal;

positioning a second photomask having an opening pattern different from that of the first photomask to much with holes produced by the primary etching;

and then exposing the coating to a parallel light source, and developing and etching the metal to form an etched shape wherein an etching factor of the shape is 2.6 or more, and dimension of a depth of a hole thereof is larger than a dimension of it's opening.

14. (New) The metal photoetching product according to claim 1, wherein the large cavity includes at least two cavities.

15. (New) The metal photoetching product according to claim 2, wherein the at least one of the large cavity and the small cavity include two or more cavities therein.

16. (New) The metal photoetching product according to claim 3, wherein at least one of the large cavity and the small cavity include two or more cavities therein.

17. (New) The metal photoetching product according to claim 4, wherein the cavity of the metal photoetching product has an etching factor of 2.6 or more, where the etching factor is EF=ED/SE wherein EF represents the etching factor, ED represents an etched depth of a cavity to be evaluated, SE represents a primary side etching which is a half of a difference between a dimension of an opening of the cavity formed by primary etching and a dimension of an opening of a photoresist pattern used for the primary etching, and when there are two primary side etchings as a result of photoetching conducted from both upper and lower surfaces of a metal substrate, SE represents the larger one.

18. (New) The metal photoetching product according to claim 4, wherein the metal pattern includes three or more continuous side walls formed by three or more etchings, wherein the side walls successively extend in the direction of thickness thereof, and have different cross sections.

19. (New) The metal photoetching product according to claim 5, wherein at least one cavity of the metal pattern includes three or more continuous side walls formed by three or more etchings, wherein the side walls successively extend in the direction of thickness thereof, and have different cross sections.